

# Perspective

# Meanings and Misunderstandings: A Social Determinants of Health Lexicon for Health Care Systems

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## **Policy Points:**

- Health care systems and policymakers in the United States increasingly
  use language related to social determinants of health in their strategies to improve health and control costs, but the terms used are often
  misunderstood, conflated, and confused.
- Greater clarity on key terms and the concepts underlying them could advance policies and practices related to social determinants of health—including by defining appropriate roles and limits of the health care sector in this multisector field.

HE LANGUAGE OF THE SOCIAL DETERMINANTS OF HEALTH IS currently in vogue in US health care. Yet the same words and concepts, such as social determinants of health and population health, are often used in different ways—sometimes with very different objectives. This, for fans of the later Wittgenstein, is how language works: the meaning of words is in their use. Confusion over health care jargon is nothing new. He use used in their use. New collaborations as a growing number of health care systems design new interventions to respond to patients' social circumstances. New collaborations among the health care, public health, and social services sectors —each often arriving with different ways of thinking about social determinants of health and social interventions—would benefit from a shared understanding of the language being used and what it means for achieving their objectives. Clarity would also benefit policymakers exploring (and testing) new payment systems and

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policies to incentivize greater health care investments in social supports. <sup>6-9</sup> This is particularly important given the potential unintended consequences of bringing language and information related to patients' social circumstances into a market-based health care system. <sup>10</sup>

In this article, we highlight some of the key terms being used in work related to social determinants of health in US health care settings. We propose an initial set of definitions for these terms, using existing definitions where available, and make distinctions between concepts commonly conflated or confused. Our goal is to provide the scaffolding for a national discussion about these terms and surface emerging distinctions between concepts and practices related to social determinants of health in health care.

## Terms and Distinctions

# Social Determinants of Health and Population Health

Social determinants of health are defined by the World Health Organization as "the conditions in which people are born, grow, live, work and age," which are "shaped by the distribution of money, power and resources." They include income, education, employment, housing, neighborhood conditions, transportation systems, social connections, and other social factors. Social determinants of health operate at multiple levels. Underlying structural factors, such as a country's macroeconomic policy; public policies on education, housing, social security, and other areas; and broader cultural and institutional contexts shape the distribution of resources across society and people's social position within it. These structural factors, in turn, shape more downstream social factors, such as living and working conditions, and access to money to buy food, clothes, and other basic resources, which form the circumstances of people's daily lives. The interactions of these factors shape health and health inequities.

Social determinants have both direct and complex effects on health. For example, poor air quality, more common in poorer neighborhoods, can quickly exacerbate asthma symptoms. <sup>13</sup> Levels of income and education, meanwhile, shape a range of health outcomes, such as the prevalence of chronic disease and life expectancy, across the life course. <sup>14-17</sup>

The combined impact of social determinants on health is stark: the poorest 1% in the United States die around 10 to 15 years earlier than the richest. <sup>18</sup> But social determinants of health are not just about the haves and have nots. The social gradient becomes a health gradient: people in the middle of the socioeconomic scale have worse health than those at the top, people lower down in the scale have worse health still, and so on. <sup>16-19</sup> This means that social determinants of health affect the whole population, not just the poorest or most vulnerable patients.

Social determinants of health are not the same as population health. Population health has been defined as "the health outcomes of a group of individuals, including the distribution of such outcomes within the group." Social determinants are just one group of factors that shape population health, alongside health care, genetics, behaviors, commercial influences, and more. Estimates differ, but most studies suggest that social, economic, environmental, and other nonmedical factors play a greater role in shaping population health than health care services. <sup>21</sup>

# Population Health Improvement and Population Health Management

Health care and public health professionals may have different interpretations of the term population health, with implications for the approach taken to improving it. In one qualitative study in 2014, health care leaders of ACOs used the term population health to describe efforts to improve care for their own patients—the individuals covered under specific health plans, or served by hospitals and clinics.<sup>3</sup> For public health leaders, however, the unit of analysis was more often the whole population living in a geographical area, such as a county or region.

These differences are, perhaps, understandable—reflecting the distinct roles, capabilities, and incentives for health care and public health in the United States. But conflicting interpretations could have unintended consequences. For example, focusing efforts to improve population health only on patients may divert attention and resources away from more upstream interventions, like improving neighborhood conditions, that are needed to improve health across whole communities. A further distinction has therefore been made between "population health improvement" and "population health management"—the latter describing approaches to improve health that focus on defined groups of

patients served by health plans, hospitals, ACOs, or other health care organizations, rather than the whole community living in a particular geographical area. Health care systems can—and sometimes do—pursue both strategies at the same time: they can focus on improving care for their patient populations while collaborating with other services and sectors to improve health for a wider geographic population. But the clear risk is that health care systems predominantly pursue more downstream interventions for their sickest and most expensive patients.

# Social Determinants of Health and Social Risk Factors

Social determinants shape health for better or worse. Higher income, for example, is associated with better health, while lower income is associated with worse health. In contrast, social risk factors are specific adverse social conditions that are associated with poor health, like social isolation or housing instability. These social risks have very real impacts on health and health care. Social isolation predicts mortality at a rate similar to more clinical risk factors. <sup>25</sup> And homeless people are at increased risk of early death, have high rates of disease and disability, and are frequent users of emergency departments and other health services. <sup>26-28</sup> As a result, patients are increasingly being asked about selective social risk factors in clinical settings. <sup>29,30</sup>

In the emerging literature on social interventions in clinical settings, these social risks to health are referred to variously as social determinants, health-related social needs, or health-related social problems, and other times simply as social needs. Given that the term risk factors is commonly used to describe any attribute or exposure of an individual that increases their likelihood of poor health, we propose that an individual-level adverse social determinant of health, such as low-education level or housing instability, be referred to as a social risk factor.

Making a distinction between social determinants of health and social risk factors could be important for at least two reasons. First, it makes clear that social determinants of health are neither negative nor positive. Social factors—whether community characteristics, financial stability, social relationships, access to services, or employment status—can increase as well as constrain people's capacity to be healthy. In other

words, social determinants of health are not things a person can have or can avoid: they affect everyone. And enhancing protective factors in the social environment, such as access to education, and family and other social supports for children and young people<sup>36</sup> can promote people's health.

Second, defining and identifying individual-level social risk factors can help health care systems target interventions to address them. For example, the Centers for Medicare and Medicaid Services (CMS) recently developed a 10-item screening tool covering five actionable social risk factors: housing instability, food insecurity, lack of transportation access, utility insecurity, and interpersonal violence. <sup>37</sup> Data on social risk factors could be aggregated to better understand where community-level interventions might improve health, as well as be used to target interventions to individual patients. <sup>38</sup>

#### Social and Behavioral Risk Factors

Social risk factors are not the same as behavioral risk factors, which include smoking, alcohol intake, other substance use, lack of exercise, and unhealthy diet. In one sense, the two are intertwined. Social factors shape individual behavior: there is a higher prevalence of unhealthy behaviors in socially disadvantaged groups. 14,39-41 The relationship also moves in the other direction: obesity, for instance, is linked to discrimination in the workplace, education, and interpersonal relationships, which, in turn, can reduce socioeconomic status. 42,43 Yet modifying individual behaviors fundamentally depends on addressing the upstream social factors that shape them. For example, individuals seeking to manage their weight through exercise and diet are constrained by the obesogenic environment that surrounds them-and individuals in poorer communities are even more constrained by fewer supermarkets, more fast food outlets, and fewer safe and accessible places to exercise.<sup>44</sup> Conflating behavioral and social risks could lead to short-sighted approaches that focus too heavily on individual behaviors-a phenomenon known as lifestyle drift, which risks widening health inequities. 45

To add to the confusion, the term behavioral risk factors is also often used in the United States as an umbrella term for mental health risks. Like in the case of behavioral and social risks, mental health and social risk factors can profoundly influence one another 46 but are not identical.

#### Social Risks and Social Needs

Social needs, meanwhile, are not necessarily synonymous with social risk factors—they also depend on people's individual preferences and priorities. Distinguishing between social risks and social needs emphasizes the patient's role in identifying and prioritizing social interventions. This concept is at the heart of efforts to implement shared-decision making in traditional medical care. The idea follows that an understanding of what matters in the context of a patient's life, combined with clinical expertise, is needed to make high-quality decisions about the right course of treatment. <sup>47</sup> Likewise, a screening tool may uncover multiple social risks, such as food, housing, and utilities instability, but the patient may tell her provider that her most pressing social need is to find a safe place to stay, away from a violent male partner. Failing to understand the patient's perspective—a common failure even within the scope of traditional biomedical care <sup>48</sup>—could lead to the wrong immediate treatment.

This distinction is illustrated by three recent studies of social screening interventions in US health care settings. In one study that focused on food insecurity screening in pediatric primary care, only half of the patients screened as food insecure asked for referrals to food-related interventions, while only half who asked for food-related interventions screened as food insecure. 49 In another study, 29% of patients screened positive for food insecurity but only 17% wanted help to address it and only 4% selected it as their top priority. 50 A third study focused on multiple social risk factors found that nearly all screened patients (97% to 99%) reported one or more social risks to health. But once clinics added questions asking whether patients wanted help to address these risks, the numbers decreased—15% of patients with documented social risks requested help in one clinic and 21% of patients requested help in another.<sup>51</sup> While clinical teams should consider the range of factors that might prevent patients from seeking social supports from their health care providers when they need them—such as stigma, fear of discrimination, previous trauma, lack of trust, or legal issues—surfacing patients' perceptions of social need could help target resources toward interventions that could most benefit patients.

# Social Needs—Informed Care and Social Needs—Targeted Care

Based on information about patients' social risk factors and needs, health care systems across the United States are increasingly developing interventions to address them. <sup>52</sup> Some make referrals to social service agencies providing food, housing, or income assistance. Others have established medical-legal partnerships or food pantries to improve access to basic social resources. And many use data about patients' social needs to improve or target traditional medical care.

There is no single term to define these activities in clinical settings. In the United Kingdom, identifying and responding to patients' social needs in general practice is often referred to as social prescribing. This language has some merits. Using established medical terms to describe social interventions might encourage clinicians to see the process of identifying social needs and linking patients with basic resources as part of their regular clinical toolkit. But it also has big drawbacks—for example, the risk of medicalizing socioeconomic hardship and alienating the community-based organizations that health care systems depend on to deliver social services. A bigger challenge, perhaps, is that the term prescription implies a solution that is known and easy to find—like a drug quickly located behind the pharmacy counter. What is the prescription given to a person without stable housing when shelters are full and affordable housing scarce?

Two terms have been proposed to categorize practices in health care settings used to respond to patients' social needs.<sup>54</sup> The first is social needs—informed care: activities that involve modifications to traditional medical care to account for patients' social circumstances. Some examples of social needs—informed care are common in clinical practice—like providing transportation to hospital appointments, or translators for patients with language barriers. Other examples of social needs—informed care may become more widespread as social screening tools offer clinical teams new data on patients' social risks. For example, data on patients' access to food could be used to inform decisions about medications (such as antibiotics that should be taken with meals) and dosing (such as distribution of basal versus meal-time insulin).<sup>55</sup> The second is social needs—targeted care: activities in clinical settings that seek to address patients' social needs directly—for example, helping patients access

income assistance if they lack financial resources, or linking them with transportation, food, or housing supports.

Both types of patient care are important, but social needs-informed care alone is insufficient if the aim is to improve the underlying social risks that adversely impact patients' health, rather than just providing better medical care. And both types of care are insufficient if the aim is to contribute to improvements in population health for the whole community—not just better care and social supports for patients in a single clinic or health plan. This is a bigger task than health care systems can accomplish alone. Improving population health requires that health care organizations collaborate with other services and sectors, such as local government, housing agencies, schools, and community-based organizations. But it also depends on wider policy interventions at the state and federal level-for example, government decisions about the level and distribution of public spending on housing, income support, transportation, and other social services—that fundamentally influence the structural social and economic conditions shaping health for individuals within those communities.

## Conclusion

The idea that health is shaped by social determinants is not new. Nor is the idea that health care professionals can—and often do—play an important role in decreasing the health impacts of adverse social circumstances. 56,57 But these ideas are now entering the mainstream of US health care. Various federal and state policy initiatives, such as the federal demonstration on accountable health communities, 28 and Medicaid waivers in Oregon, California, and elsewhere, 9 have strengthened the role of health care systems in identifying and addressing patients' social needs. Most of these efforts (and their evaluations) are still nascent, which means that we still know relatively little about how health care payers and providers can best intervene to improve patients' social circumstances in different contexts. 46 As health care initiatives related to the social determinants of health grow in number and scale, greater clarity over the language used and concepts underlying them is likely to aid both their implementation and evaluation. While we have focused on developing a social determinants of health lexicon for health care systems

in the United States, several of the terms and distinctions described will be relevant in other countries.

## References

- 1. Garrett D, Hwang A, Pierce-Wrobel C. Social determinants of health: a public health concept in conflict. *Health Affairs* blog. March 30, 2018. https://www.healthaffairs.org/do/10.1377/hblog20180530.484098/full/. Accessed April 1, 2019.
- 2. Wittgenstein L. *Philosophical Investigations*. 4th ed. Oxford, UK: Wiley-Blackwell; 2009.
- 3. Noble D, Greenhalgh T, Casalino LP. Improving population health one person at a time? Accountable care organisations: perceptions of population health—a qualitative interview study. *BMJ Open.* 2014;4:e004665. doi:10.1136/bmjopen-2013-004665
- 4. Kindig D. Understanding population health terminology. *Milbank* 0. 2007;85(1):139-161.
- 5. Siegel B, Erickson J, Milstein B, Evans Pritchard K. Multisector partnerships need further development to fulfill aspirations for transforming regional health and well-being. *Health Aff*. 2018;37(1):30-37.
- 6. Bachrach D, Guyer J, Levin A; Milbank Memorial Fund. Medicaid coverage for social interventions: a roadmap for states. https://www.milbank.org/publications/medicaid-coverage-social-interventions-road-map-states/. Published July 25, 2016. Accessed April 1, 2019.
- 7. Machledt D; Commonwealth Fund. Addressing the social determinants of health through Medicaid managed care. https://www.commonwealthfund.org/publications/issue-briefs /2017/nov/addressing-social-determinants-health-through -medicaid-managed. Published November 29, 2017. Accessed April 1, 2019.
- 8. Kaiser Family Foundation. Section 1115 Medicaid demonstration waivers: the current landscape of approved and pending waivers. https://www.kff.org/medicaid/issue-brief/section-1115-medicaid-demonstration-waivers-the-current-landscape-of-approved-and-pending-waivers/. Published February 12, 2019. Accessed April 1, 2019.
- 9. Barr P, Dickson V. CMS may allow hospitals to pay for housing through Medicaid. *Modern Healthcare*. November 14, 2018. https://www.modernhealthcare.com/article/20181114/NEWS/181119981. Accessed April 1, 2019.

- Gottlieb L, Alderwick H. Integrating social and medical care: could it worsen health and increase inequity? *Ann Fam Med*. 2019;17(1):77-81.
- 11. World Health Organization, Commission on Social Determinants of Health. Closing the gap in a generation: health equity through action on the social determinants of health. Commission on Social Determinants of Health final report. https://apps.who.int/iris/bitstream/handle/10665/43943/978924 1563703\_eng.pdf;jsessionid=365271ACE20528885428817 00EEDCA8B?sequence=1. Published 2008. Accessed April 1, 2019.
- 12. Solar O, Irwin A; World Health Organization. A conceptual framework for action on the social determinants of health. Social Determinants of Health Discussion Paper 2 (Policy and Practice). https://www.who.int/sdhconference/resources/Conceptualframe workforactiononSDH\_eng.pdf. Published 2010. Accessed April 1, 2019.
- 13. Guarnieri M, Balmes JR. Outdoor air pollution and asthma. *Lancet*. 2014:383(9928):1581-1592. doi:10.1016/S0140-6736 (14)60617-6
- 14. Adler NE, Stewart J. Health disparities across the lifespan: meaning, methods, and mechanisms. *Ann NY Acad Sci.* 2010;1186:5-23. doi:10.1111/j.1749-6632.2009.05337.x
- 15. Kaplan GA, Shema SJ, and Leite CM. Socioeconomic determinants of psychological well-being: the role of income, income change, and income sources during the course of 29 years. *Ann Epidemiol*. 2008;18:531-537.
- 16. Stringhini S, Sabia S, Shipley M, et al. Association of socioe-conomic position with health behaviors and mortality. *JAMA*. 2010;303(12):1159-1166.
- 17. Jemal A, Thun MJ, Ward EE, Henley SJ, Cokkinides VE, Murray TE. Mortality from leading causes by education and race in the United States, 2001. *Am J Prev Med.* 2008;34:1-8.
- 18. Chetty R, Stepner M, Abraham S, et al. The association between income and life expectancy in the United States, 2001–2014. *JAMA*. 2016;315:1750-1766.
- 19. Marmot MG, Smith GD, Stansfeld S, et al. Health inequalities among British civil servants: the Whitehall II study. *Lancet*. 1991; 337(8754):1387-1393.
- 20. Kindig D, Stoddart G. What is population health? *Am J Public Health*. 2003;93:380-383.

- 21. Braveman P, Gottlieb L. The social determinants of health: it's time to consider the causes of the causes. *Public Health Rep.* 2014;129(suppl 2):19-31.
- 22. Skinner D, Franz B, Taylor M, Shaw C, Kelleher KJ. How U.S. children's hospitals define population health: a qualitative, interview-based study. *BMC Health Serv Res.* 2018;18:494.
- 23. Kindig D. What are we talking about when we talk about population health? *Health Affairs* Blog. April 6, 2015. https://www.healthaffairs.org/do/10.1377/hblog20150406.0461 51/full/. Accessed April 1, 2019.
- 24. Castrucci B, Auerbach J. Meeting individual social needs falls short of addressing social determinants of health. *Health Affairs* Blog. January 16, 2019. https://www.healthaffairs.org/do/10.1377/hblog20190115.234942. Accessed April 1, 2019.
- 25. Pantell M, Rehkopf D, Jutte D, Syme SL, Balmes J, Adler N. Social isolation: a predictor of mortality comparable to traditional clinical risk factors. *Am J Public Health*. 2013;103(11):2056-2062.
- 26. Kushel MB, Perry S, Bangsberg D, Clark R, Moss AR. Emergency department use among the homeless and marginally housed: results from a community-based study. *Am J Public Health*. 2002;92(5):778-784.
- 27. Kushel MB, Vittinghoff E, Haas JS. Factors associated with the health care utilization of homeless persons. *JAMA*. 2001;285(2):200-206.
- 28. Chambers C, Chiu S, Katic M, Kiss A, Redelmeier DA, Levinson W, Hwang SW. High utilizers of emergency health services in a population-based cohort of homeless adults. *Am J Public Health*. 2013;103(Suppl 2):S302-310.
- 29. Gottlieb L, Fichtenberg C, Adler N. Screening for social determinants of health. *JAMA*. 2016;316(23):2552.
- 30. Screening tools. Social Interventions Research and Evaluations Network website. http://sirenetwork.ucsf.edu/tools-resources/screening-tools. Accessed April 1, 2019.
- 31. Andermann A. Screening for social determinants of health in clinical care: moving from the margins to the mainstream. *Public Health Rev.* 2018;39:19.
- 32. Alley DE, Asomugha CN, Conway PH, Sanghavi DM. Accountable health communities—addressing social needs through Medicare and Medicaid. *N Engl J Med.* 2016;374(1):8-11.
- 33. Baer TE, Scherer EA, Fleegler EW, Hassan A. Food insecurity and the burden of health-related social problems in an urban youth population. *J Adolesc Health*. 2015;57(6):601-607.

- 34. Gottlieb LM, Hessler D, Long D, et al. Effects of social needs screening and in-person service navigation on child health: a randomized clinical trial. *JAMA Pediatr.* 2016;170(11):e162521.
- 35. Risk factors. World Health Organization website. http://www.who.int/topics/risk\_factors/en/. Accessed April 1, 2019.
- 36. Viner RM, Ozer EM, Denny S, et al. Adolescence and the social determinants of health. *Lancet*. 2012;379(9826):1641-1652.
- 37. Billioux A, Verlander K, Anthony S, Alley D; National Academy of Medicine. Standardized screening for health-related social needs in clinical settings: the accountable health communities screening tool. https://nam.edu/wp-content/uploads/2017/05/Standardized-Screening-for-Health-Related-Social-Needs-in-Clinical-Settings. pdf. Published May 30, 2017. Accessed April 1, 2019.
- 38. Beck AF, Klein MD, Schaffzin JK, Tallent V, Gillam M, Kahn RS. Identifying and treating a substandard housing cluster using a medical-legal partnership. *Pediatrics*. 2012;130(5):831-838.
- 39. Adler N, Newman K. Socioeconomic disparities in health: pathways and policies. *Health Aff.* 2002;21(2):60-76.
- 40. Poortinga W. The prevalence and clustering of four major lifestyle risk factors in an English adult population. *Prev Med*. 2007;44(2):124-128.
- 41. Lantz PM, Golberstein E, House JS, Morenoff JD. Socioeconomic and behavioral risk factors for mortality in a national 19-year prospective study of U.S. adults. *Soc Sci Med.* 2010;70(10):1558-1566.
- 42. Wang Y, Beydoun. The obesity epidemic in the United States—gender, age, socioeconomic, racial/ethnic, and geographic characteristics: a systematic review and meta-regression analysis. *Epidemiologic Reviews*. 2007;29:6-28.
- 43. Andreyeva T, Puhl RM, Brownell KD. Changes in Perceived weight discrimination among Americans, 1995–1996 through 2004–2006. *Obesity*. 2008;16(5):1129-1134.
- 44. Alder NE, Stewart J. Reducing obesity: motivating action while not blaming the victim. *Milbank Q.* 2009;87(1):49-70.
- 45. Adams J, Mytton O, White M, Monsivais P. Why are some population interventions for diet and obesity more equitable and effective than others? The role of individual agency. *PLoS Med.* 2016;13:e1001990.
- 46. World Health Organization and Calouste Gulbenkian Foundation. *Social determinants of mental health*. Geneva, Switzerland: World Health Organization. https://www.who.int/mental\_health/publications/gulbenkian\_paper\_social\_determinants\_of\_mental\_health/en/. Published in 2014. Accessed April 7, 2019.

- 47. Mulley A, Elwyn G. Stop the silent misdiagnosis: patients' preferences matter. *BMJ*. 2012;345:e6572.
- 48. Singh Ospina N, Phillips KA, Rodriguez-Gutierrez R, et al. Eliciting the patient's agenda—secondary analysis of recorded clinical encounters. *J Gen Intern Med.* 2019;34(1):36-40. doi:10.1007/s11606-018-4540-5
- Bottino CJ, Rhodes ET, Kreatsoulas C, Cox JE, Fleegler EW. Food insecurity screening in pediatric primary care: can offering referrals help identify families in need? *Acad Pediatr*. 2017;17(5):497-503.
- Hassan A, Scherer EA, Pikcilingis A, et al. Improving social determinants of health: effectiveness of a web-based intervention. Am J Prev Med. 2015;49(6):822-831.
- 51. Gold R, Bunce A, Cowburn S, et al. Learnings from community Health centers' adoption of social determinants of health EHR tools. *Ann Fam Med.* 2018;16(5):399-407.
- 52. Gottlieb LM, Wing H, Adler NE. A Systematic review of interventions on patients' social and economic needs. *Am J Prev Med*. 2017;53(5):719-729.
- 53. Alderwick H, Gottlieb L, Fichtenberg C, Adler N. Social prescribing in the U.S. and England: emerging interventions to address patients' social needs. *Am J Prev Med.* 2018; 54(5):715-718.
- 54. Gottlieb LM, Fichtenberg C, Alderwick H, Adler NE. Social determinants of health: what's a healthcare system to do? *J Healthc Manag*. In press.
- 55. Seligman H, Bolger AF, Guzman D, et al. Exhaustion of food budgets at month's end and hospital admissions for hypoglycemia. *Health Aff.* 2014;33(1):116-123.
- 56. Pridan D. Rudolf Virchow and social medicine in historical perspective. *Med Hist*. 1964;8:274-278.
- 57. Lefkowitz B. Community Health Centers: A Movement and the People Who Made It Happen. Piscataway, NJ: Rutgers University Press; 2007.

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